REMARKS

The foregoing amendment amends claims 1, 6, 8, 9, 10 and 13 for purposes of clarity and adds claims 32-35. Pending in the application are claims 1-35, of which claims 1, 21, 26 and 30-35 are independent. Claims 21-31 have been withdrawn pursuant to a Restriction Requirement. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Claims 1 are amended to change the phrase "optical components of a node" to ---one or more components of an optical node---. Consequential changes have been made to claims 6, 8, 9, 10 and 13.

New independent claim 32 recites the subject matter of original claim 4, which the Examiner indicated as reciting allowable subject matter.

New independent claim 33 recites the subject matter of original claim 16, which the Examiner indicated as reciting allowable subject matter.

New independent claim 34 recites the subject matter of original claim 19, which the Examiner indicated as reciting allowable subject matter.

New independent claim 35 corresponds to original claim 1, and further recites that each supervisory signal shares equally in the combined optical power from the array of external light sources. *No new matter is added.*

Claim Objections

The Examiner objects to claim 1 for failing to clearly point out and distinctly claim the subject matter which Applicant regards as his invention. According to the Examiner, the term "optical components" is vague and indefinite. It is Applicant's position that the term "optical components" is a known term in the art and refers to any component of an optical switch, which is a device that can switch optical signals between different optical fibers, without the need for conversion to electrical signals. Examples of optical switch technologies, include 3D-MEMS (micro electro mechanical machines), 2-D MEMS, liquid

crystals, thermo-optics, holograms, liquid gratings and acousto-optics and bubble jets. In an illustrative embodiment, the component of the optical node that is controlled using the supervisory signals are mirrors. However, the claimed system can be utilized for and applied to any component of a communications network requiring an external light source to monitor and control the component, for example, to monitor the performance of a light path through a switch.

To clarify the recitation, Applicant has amended the claims to recite ---a component of an optical switch---, rather than "optical components".

Regarding the Examiner's confusion as to the manner in which the signals from different sources combine to form a plurality of supervisory signals, Applicant submits that the combining and subsequent splitting of laser light signals would be clear to one of ordinary skill in the art in view of the specification and Figures 2 and 3A.

Claim 1 is not directed to a power-sharing coupler *within* the path of a data signal carrying information. Rather, claim 1 is directed to a system for creating a plurality of supervisory signals *external* to the data signal and the data signal path. These supervisory signals, *after creation*, are subsequently passed into the path of the data signal to monitor and control the performance of a component within the path of the data signal to ensure the accuracy of the path of the data signal.

As recited in claim 1, the plurality of supervisory signals are created from an array of light signals, which are formed by an array of *external* light sources, for example, the array of light sources 31 in Figures 2 and 3A. The light signals produced by the light sources pass to a power-sharing coupler, for example, the power sharing coupler 32 in Figures 2 and 3A, which *combines* the light signals together, then divides the combined signal into a plurality of different supervisory signals, for examples, signals S1-SM in Figures 2 and 3A. In effect, the sum of all the light sources is distributed among the supervisory signals, such that each supervisory signal shares in the output from each of the light sources. *After* creation of the supervisory signals using the power-sharing coupler, the supervisory signals pass to an optical network, and are then used to monitor data signals passing through an optical network. For example, in Figure 3A, an input coupler 43, which is different from the power

sharing coupler, combines a first supervisory signal 41 from the power-sharing coupler with a high-speed data signal 42, in order to transmit the supervisory signal 41 through the switch 10.

The combining and subsequent splitting of the laser light signals can be accomplished through a variety of passive methods known in the art. For example, according to one embodiment, the power-sharing coupler comprises combinations of passive two-input couplers for combining the light signals from the array of laser sources in a distributed manner. According to an alternate embodiment, the power-sharing coupler comprises a single M-by-N coupler, including an intake manifold for gathering several light signal inputs into one combined output signal and a distribution manifold for splitting the combined output signal into several outputs.

35 U.S.C. §102 Rejections

In the Office Action, the Examiner rejects claims 1-3 under 35 U.S.C. §102(b) as being anticipated by Shiragaki et al. (U.S. Patent Number 5,757,526). Applicant respectfully traverses the rejection and submits that claims 1-3 are patentable over the Shiragaki reference.

The Shiragaki reference describes an optical communications network for detecting faults by superimposing a monitoring signal on an optical data signal to form a superimposed signal for transmitting the monitoring signal and the optical data signal along an optical transmission path. In Shiragaki, an optical coupler, such as the optical coupler 204 or 205 in Figure 2, is used to superimpose a single monitoring signal, provided directly from an optical transmitter, with a single data signal. Downstream, at another location in the optical transmission path, a *different* WDM coupler, such as the WDM coupler 208, 209 or 102, separates the monitoring signal from the data signal. The data signal and the monitoring signal then pass to separate receivers. A processor analyzes the monitoring signal and/or the data signal to detect a fault in the node.

The optical couplers 204 and 205 in the Shiragaki reference correspond to the input coupler 43 in the present application, which combines a supervisory signal 41, formed using the claimed power-sharing coupler, with a high-speed data signal 42 in order to transmit the

supervisory signal through the switch 10 along with the data signal. The coupler 102 cited by the Examiner in paragraph 5 of the Office Action corresponds to the output coupler 44 in the present application which separates the supervisory signal 41 from the data signal 42 and directs the supervisory signal 41 to a detector 45, not a *power-sharing* coupler.

The Shiragaki reference does not teach or suggest a power-sharing coupler for *creating* a plurality of *supervisory signals* for controlling a component of a node, as recited in claim 1. Rather, Shiragaki merely describes a system for superimposing a supervisory signal on a data signal.

The Shiragaki reference also does not teach or suggest a power-sharing coupler connected to an array of light sources for *combining* light signals from the light sources together to create a combined signal, as recited in claim 1. The optical couplers 204 and 205 in Shiragaki do not form a *combined* signal, as recited in claim 1, since the data signal and the monitoring signal are still discrete signals having different wavelengths, as clearly set forth in column 7, lines 2-5, which are merely transmitted through the same optical path.

The Shiragaki reference also does not teach or suggest a power-sharing coupler that subsequently *splits* a combined signal into a plurality of supervisory signals, as also recited in claim 1. For example, the WDM couplers 208, 209 and/or 102 in Shiragaki, which are separate components located *downstream* from the WDM couplers 204 and 205, do not *split* a combined signal into a plurality of signals. Rather, the WDM couplers 208, 209 and/or 102, in Shiragaki merely separate two already discrete signals, i.e., the monitoring signal and the data signal, in order to pass the monitoring signal to a receiver and the data signal to a different destination.

The Shiragaki system includes no component, i.e., a power-sharing coupler, for combining a *plurality* of light signals into a single combined signal and *splitting* the combined signal into a *plurality* of supervisory signals, such that the power of each initial light signal is distributed among each of the supervisory signals.

For at least these reasons, independent claim 1, and claims 2-3, which depend on claim 1, are patentable over the Shiragaki reference.

35 U.S.C. §103(a) Rejections

The Examiner also rejects claims 10-15 under 35 U.S.C. §103(a) as being unpatentable over the Shiragaki reference in view of Bhalla et al. (U.S. Patent Number 6,301,402). Because independent claim 1 is patentable over the Shiragaki reference, as described above, claims 10-15, which depend from claim 1, are also patentable over the Shiragaki reference and the Bhalla reference.

Furthermore, the Bhalla reference does not compensate for the deficiencies of the Shiragaki reference, because the Bhalla reference also does not teach or suggest the claimed power-sharing coupler. In the Bhalla reference, a generator 13 generates an out-of-band test signal for monitoring the switch, which is routed through an optical switch 11 during a time period when in-band signals are *not* being transmitted through the switch. The Bhalla reference does not teach or suggest a power-sharing coupler for generating a plurality of supervisory signals by combining and splitting a plurality of light signals from a plurality of light sources.

New Claims

The subject matter of claims 4, 16 and 19 has been rewritten in independent form in claims 32, 33 and 34, respectfully. Since the Examiner indicated claims 4, 16 and 19 to recite patentable subject matter, claims 32-34 are allowable over the cited references.

New independent claim 35 is directed to a feedback control system including a power-sharing coupler for creating a plurality of supervisory signals from an array of external light sources. As recited in claim 35, each supervisory signal created by the power-sharing coupler shares equally in the combined optical power from the array of external light sources, a feature neither taught nor suggested in the cited references. As described above, the WDM couplers in the Shiragaki reference merely separate already distinct signals from each other. These distinct signals do not share in a combined optical power, since each signal is generated from a different source.

CONCLUSION

For the foregoing reasons, Applicants contend that pending claims 1-21 and 32-35 distinguish patentably over the cited references and that the claims are clear and definite. As such, the Applicants respectfully request that the Examiner's rejections so far as they are based upon 35 U.S.C. §102 and 35 U.S.C. §103 be reconsidered and withdrawn and that the application be passed to allowance.

If there are any remaining issues, an opportunity for an interview is requested prior to the issuance of another Office Action. If the above amendments are not deemed to place this case in condition for allowance, the Examiner is urged to call the Applicants' representative at the telephone number listed below.

Respectfully submitted,

Date: **September 19, 2003**

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